

## SEQUENCE LISTING

&lt;110&gt; JAPAN SCIENCE AND TECHNOLOGY CORPORATION

&lt;120&gt; High-Affinity Choline Transporter

&lt;130&gt; A011-05PCT

&lt;140&gt;

&lt;141&gt;

&lt;150&gt; JP 11/240642

&lt;151&gt; 1999-08-27

&lt;150&gt; JP 11/368991

&lt;151&gt; 1999-12-27

&lt;160&gt; 8

&lt;170&gt; PatentIn Ver. 2.1

&lt;210&gt; 1

&lt;211&gt; 1731

&lt;212&gt; DNA

&lt;213&gt; Caenorhabditis elegans

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(1731)

&lt;400&gt; 1

atg gcc gac tta ttg ggt atc glg gcc att gtg ttc ttc tac gtg ctc 48  
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1

5

10

15

att ctt gtc gtt gga ata tgg gcg ggt aga aaa tgc aaa agt tca aaa 96  
 Ile Leu Val Val Gly Ile Trp Ala Gly Arg Lys Ser Lys Ser Ser Lys  
 20 25 30

gag ctt gaa tca gaa gcc ggc gcg gcg acg gaa gag gtg atg ita gct 144  
 Glu Leu Glu Ser Glu Ala Gly Ala Ala Thr Glu Glu Val Met Leu Ala  
 35 40 45

ggg aga aac atc gga act ctt gtc gga att ttc aca atg act gcc acg 192  
 Gly Arg Asn Ile Gly Thr Leu Val Gly Ile Phe Thr Met Thr Ala Thr  
 50 55 60

tgg gtt ggc ggt gct tat atc aat gga acc gcc gag gct ctg tat aat 240  
 Trp Val Gly Gly Ala Tyr Ile Asn Gly Thr Ala Glu Ala Leu Tyr Asn  
 65 70 75 80

gga ggt ctc ctt gga tgt cag gct cca gtt gga tat gca att tcc ctt 288  
 Gly Gly Leu Leu Gly Cys Gln Ala Pro Val Gly Tyr Ala Ile Ser Leu  
 85 90 95

gtt atg gga gga cta ctt ttc gca aag aaa atg cga gaa gaa gga tat 336  
 Val Met Gly Gly Leu Leu Phe Ala Lys Lys Met Arg Glu Glu Gly Tyr  
 100 105 110

att aca atg ctc gat cct ttt cag cac aaa tat ggc caa cga atc ggt 384  
 Ile Thr Met Leu Asp Pro Phe Gln His Lys Tyr Gly Gln Arg Ile Gly  
 115 120 125

ggc ttg atg tat gtt cca gca ctt ctt ggt gaa aca ttc tgg aca gca 432  
 Gly Leu Met Tyr Val Pro Ala Leu Leu Gly Glu Thr Phe Trp Thr Ala  
 130 135 140

gcc att ctt tgc gca ctt ggt gca aca ctg tgc gta att ctt gga atc 480  
 Ala Ile Leu Ser Ala Leu Gly Ala Thr Leu Ser Val Ile Leu Gly Ile  
 145 150 155 160

gac atg aat gca tca gtg acc ctg tcg gcc tgt att gcc gla ttc tac 528  
 Asp Met Asn Ala Ser Val Thr Leu Ser Ala Cys Ile Ala Val Phe Tyr  
 165 170 175

aca ttc acc ggt gga tac tat gca glc gcg tac act gac glc gtt caa 576  
 Thr Phe Thr Gly Gly Tyr Tyr Ala Val Ala Tyr Thr Asp Val Val Gln  
 180 185 190

cta ttt tgc att ttc glc ggt ttg tgg gtt tgc gtg ccg gcg gct atg 624  
 Leu Phe Cys Ile Phe Val Gly Leu Trp Val Cys Val Pro Ala Ala Met  
 195 200 205

gtg cat gat ggt gcg aag gat att tcc agg aat gca ggc gac tgg att 672  
 Val His Asp Gly Ala Lys Asp Ile Ser Arg Asn Ala Gly Asp Trp Ile  
 210 215 220

gga gag att gga gga ttc aaa gaa aca tct ctc tgg att gat tgc atg 720  
 Gly Glu Ile Gly Gly Phe Lys Glu Thr Ser Leu Trp Ile Asp Cys Met  
 225 230 235 240

ctt ctc ctt gtc ttt gga gga att cca tgg caa gtg tac ttc caa aga 768  
 Leu Leu Leu Val Phe Gly Gly Ile Pro Trp Gln Val Tyr Phe Gln Arg  
 245 250 255

gtt ctc tcc tca aaa act gct cat gga gca cag acg ttg tcg ttt gtg 816  
 Val Leu Ser Ser Lys Thr Ala His Gly Ala Gln Thr Leu Ser Phe Val  
 260 265 270

gcg ggc glc gga tgc att ctc atg gcg att cca cca gcg ttg atc ggt 864  
 Ala Gly Val Gly Cys Ile Leu Met Ala Ile Pro Pro Ala Leu Ile Gly  
 275 280 285

gca att gcc agg aac aca gac tgg aga atg act gat tat tcc cca tgg 912  
 Ala Ile Ala Arg Asn Thr Asp Trp Arg Met Thr Asp Tyr Ser Pro Trp

290	295	300	
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Asn Asn Gly Thr Lys Val Glu Ser Ile Pro Pro Asp Lys Arg Asn Met			
305	310	315	320
gig gtc ccg ttg gla ttc cag tat ctt acg cca aga tgg gtc gcc ttt			1008
Val Val Pro Leu Val Phe Gln Tyr Leu Thr Pro Arg Trp Val Ala Phe			
325	330	335	
att gga ctc ggc gca gig tcg gct gct gla atg tca tct gca gat tca			1056
Ile Gly Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser			
340	345	350	
tct gla cta tca gca gca tca atg ttt gct cac aac atc tgg aag ctc			1104
Ser Val Leu Ser Ala Ala Ser Met Phe Ala His Asn Ile Trp Lys Leu			
355	360	365	
aca att cgc cct cac gcg tct gaa aaa gaa gtg ata att gtg atg aga			1152
Thr Ile Arg Pro His Ala Ser Glu Lys Glu Val Ile Ile Val Met Arg			
370	375	380	
ata gcc atc atc tgt gtt ggt atc atg gca acc atc atg gca ctt acc			1200
Ile Ala Ile Ile Cys Val Gly Ile Met Ala Thr Ile Met Ala Leu Thr			
385	390	395	400
att caa tcc atc tat ggg ctt tgg tat ctt tgt gca gat ttg gtc tac			1248
Ile Gln Ser Ile Tyr Gly Leu Trp Tyr Leu Cys Ala Asp Leu Val Tyr			
405	410	415	
glc ata ctc ttc cct caa cta tta tgt gtt gla tat atg cca cgt agc			1296
Val Ile Leu Phe Pro Gln Leu Leu Cys Val Val Tyr Met Pro Arg Ser			
420	425	430	
aat acg tat ggc tca ttg gct ggc tat gca gtc ggt ctt gtg ctc cgt			1344

Asn Thr Tyr Gly Ser Leu Ala Gly Tyr Ala Val Gly Leu Val Leu Arg  
 435 440 445

tig att gga ggc gag cca ctt gta tgc ctg cca gcg ttc ttc cat tat 1392  
 Leu Ile Gly Gly Glu Pro Leu Val Ser Leu Pro Ala Phe Phe His Tyr  
 450 455 460

cca atg tat acg gat ggg gta cag tat ttc cca ttc agg aca act gct 1440  
 Pro Met Tyr Thr Asp Gly Val Gln Tyr Phe Pro Phe Arg Thr Thr Ala  
 465 470 475 480

atg tta tct tca atg gct act atc tac att gta tca ata caa tgc gag 1488  
 Met Leu Ser Ser Met Ala Thr Ile Tyr Ile Val Ser Ile Gln Ser Glu  
 485 490 495

aag ctg ttc aaa tgc gga cgt ttg tct ccg gag tgg gac gta atg ggt 1536  
 Lys Leu Phe Lys Ser Gly Arg Leu Ser Pro Glu Trp Asp Val Met Gly  
 500 505 510

tgt gta gtg aat att ccg ata gat cat gta ccc ctt ccg tca gat gta 1584  
 Cys Val Val Asn Ile Pro Ile Asp His Val Pro Leu Pro Ser Asp Val  
 515 520 525

tcg ttt gct gtt agt agt gag acc ttg aat atg aag gct cca aac gga 1632  
 Ser Phe Ala Val Ser Ser Glu Thr Leu Asn Met Lys Ala Pro Asn Gly  
 530 535 540

aca ccg gct cca gta cat ccg aac caa cag ccg tct gat gaa aat aca 1680  
 Thr Pro Ala Pro Val His Pro Asn Gln Gln Pro Ser Asp Glu Asn Thr  
 545 550 555 560

tta tta cat cca tat tgc gac caa agt tat tat tcc aca aat agc aat 1728  
 Leu Leu His Pro Tyr Ser Asp Gln Ser Tyr Tyr Ser Thr Asn Ser Asn  
 565 570 575

taa

1731

&lt;210&gt; 2

&lt;211&gt; 576

&lt;212&gt; PRT

&lt;213&gt; Caenorhabditis elegans

&lt;400&gt; 2

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 Ile Leu Val Val Gly Ile Trp Ala Gly Arg Lys Ser Lys Ser Ser Lys  
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 Glu Leu Glu Ser Glu Ala Gly Ala Ala Thr Glu Glu Val Met Leu Ala  
 35 40 45  
 Gly Arg Asn Ile Gly Thr Leu Val Gly Ile Phe Thr Met Thr Ala Thr  
 50 55 60  
 Trp Val Gly Gly Ala Tyr Ile Asn Gly Thr Ala Glu Ala Leu Tyr Asn  
 65 70 75 80  
 Gly Gly Leu Leu Gly Cys Gln Ala Pro Val Gly Tyr Ala Ile Ser Leu  
 85 90 95  
 Val Met Gly Gly Leu Leu Phe Ala Lys Lys Met Arg Glu Glu Gly Tyr  
 100 105 110  
 Ile Thr Met Leu Asp Pro Phe Gln His Lys Tyr Gly Gln Arg Ile Gly  
 115 120 125  
 Gly Leu Met Tyr Val Pro Ala Leu Leu Gly Glu Thr Phe Trp Thr Ala  
 130 135 140  
 Ala Ile Leu Ser Ala Leu Gly Ala Thr Leu Ser Val Ile Leu Gly Ile  
 145 150 155 160  
 Asp Met Asn Ala Ser Val Thr Leu Ser Ala Cys Ile Ala Val Phe Tyr  
 165 170 175  
 Thr Phe Thr Gly Gly Tyr Tyr Ala Val Ala Tyr Thr Asp Val Val Gln  
 180 185 190  
 Leu Phe Cys Ile Phe Val Gly Leu Trp Val Cys Val Pro Ala Ala Met

195	200	205
Val His Asp Gly Ala Lys Asp Ile Ser Arg Asn Ala Gly Asp Trp Ile		
210	215	220
Gly Glu Ile Gly Gly Phe Lys Glu Thr Ser Leu Trp Ile Asp Cys Met		
225	230	235
Leu Leu Leu Val Phe Gly Gly Ile Pro Trp Gln Val Tyr Phe Gln Arg		240
245	250	255
Val Leu Ser Ser Lys Thr Ala His Gly Ala Gln Thr Leu Ser Phe Val		
260	265	270
Ala Gly Val Gly Cys Ile Leu Met Ala Ile Pro Pro Ala Leu Ile Gly		
275	280	285
Ala Ile Ala Arg Asn Thr Asp Trp Arg Met Thr Asp Tyr Ser Pro Trp		
290	295	300
Asn Asn Gly Thr Lys Val Glu Ser Ile Pro Pro Asp Lys Arg Asn Met		
305	310	315
Val Val Pro Leu Val Phe Gln Tyr Leu Thr Pro Arg Trp Val Ala Phe		320
325	330	335
Ile Gly Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser		
340	345	350
Ser Val Leu Ser Ala Ala Ser Met Phe Ala His Asn Ile Trp Lys Leu		
355	360	365
Thr Ile Arg Pro His Ala Ser Glu Lys Glu Val Ile Ile Val Met Arg		
370	375	380
Ile Ala Ile Ile Cys Val Gly Ile Met Ala Thr Ile Met Ala Leu Thr		
385	390	395
Ile Gln Ser Ile Tyr Gly Leu Trp Tyr Leu Cys Ala Asp Leu Val Tyr		400
405	410	415
Val Ile Leu Phe Pro Gln Leu Leu Cys Val Val Tyr Met Pro Arg Ser		
420	425	430
Asn Thr Tyr Gly Ser Leu Ala Gly Tyr Ala Val Gly Leu Val Leu Arg		
435	440	445
Leu Ile Gly Gly Glu Pro Leu Val Ser Leu Pro Ala Phe Phe His Tyr		
450	455	460
Pro Met Tyr Thr Asp Gly Val Gln Tyr Phe Pro Phe Arg Thr Thr Ala		
465	470	475
		480

8 / 29



35	40	45	
att ggt ttg ttg gtt ggt ggt ttt acc atg aca gcc acc tgg gtt gga			192
Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly			
50	55	60	
gga ggt tac atc aac ggg aca gct gaa gca gtt tat ggg cca ggt tgt			240
Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys			
65	70	75	80
ggt cta gct tct gct cag gca ccc att gga tat tct ctg agt ctg att			288
Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile			
85	90	95	
tta ggt ggc ctg ttt ttt gca aaa cct atg cgt tcc aag gga tat gtg			336
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val			
100	105	110	
act atg tta gac ccg ttt caa cag atc tat gga aag cgc atg ggt ggg			384
Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly			
115	120	125	
ctg ctg ttc atc cct gca ctg atg gga gag atg ttc tgg gct gca gca			432
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala			
130	135	140	
att ttc tct gca tta ggg gct acc atc agc gta atc att gat gtg gat			480
Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp			
145	150	155	160
gtg aac ata tcg gtc att gtc tcc gca ctc att gcc att ctt tat acc			528
Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr			
165	170	175	
ctc gtg gga ggg ctc tac tct gtg gca tat act gat gtt gta cag cta			576

Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu  
 180 185 190

ttc tgc att ttt ata gga ttg tgg atc agt gtc cca ttt gcc ctg tca 624  
 Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser  
 195 200 205

cat cct gca gtc acc gac att gga ttc act gct gig cat gct aaa tac 672  
 His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr  
 210 215 220

cag agt ccc tgg ctg gga acc att gaa tca gtt gaa gtc tac acc tgg 720  
 Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp  
 225 230 235 240

ctt gat aat ttt ctg ttg ttg atg ctg ggt gga ata cca tgg caa gcc 768  
 Leu Asp Asn Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala  
 245 250 255

tac ttc cag agg gtc ctc tct tca tct tca gcg acc tat gct cag gtg 816  
 Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val  
 260 265 270

ctg tcc ttc ctg gca gct ttt ggg tgc ctg gtg atg gct cta cca gcc 864  
 Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala  
 275 280 285

att tgc att ggg gcc att gga gcc tcc aca gac tgg aac caa act gca 912  
 Ile Cys Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala  
 290 295 300

tat ggg ttt cca gat ccc aag acc aag gag gaa gca gac atg att ctc 960  
 Tyr Gly Phe Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu  
 305 310 315 320

ccg att gtt cta cag tac ctc tgc cct gtg tac att tcc ttc ttt ggg 1008  
 Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly  
 325 330 335

ctt ggt gct gtt tct gct gct gtc atg tcc tgc gct gac tca tcc atc 1056  
 Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile  
 340 345 350

cta tca gca agt tcc atg ttt gct cgg aat atc tac cag ctt tcc ttc 1104  
 Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe  
 355 360 365

aga caa aat gca tca gac aag gaa att gtg tgg gtc atg agg atc act 1152  
 Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr  
 370 375 380

gtg ttt gtg ttt gga gca tct gca aca gcc atg gcc ttg ctc acg aag 1200  
 Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys  
 385 390 395 400

act gtg tat ggg ctc tgg tac ctg agc tct gac ctt gtc tac atc atc 1248  
 Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile  
 405 410 415

atc ttc cca cag ctg ctc tgt gta ctc ttc atc aaa gga acc aac act 1296  
 Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr  
 420 425 430

tat ggg gca gtt gct ggt tat att ttt gga ctt ttc ctg aga att acc 1344  
 Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr  
 435 440 445

gga gga gag cca tat cta tac ttg cag ccc tta atc ttc tac cct ggt 1392  
 Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly  
 450 455 460

tat tac cct gac aag aat ggt ata tac aat cag agg ttc cca ttt aaa 1440  
 Tyr Tyr Pro Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys  
 465 470 475 480

act ctc tcc atg gtt acc tca ttc ttt acc aac att tgt gtt tcc tat 1488  
 Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr  
 485 490 495

cia gcc aag tat cia ttt gaa agt gga acc ttg cct cca aaa tta gat 1536  
 Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp  
 500 505 510

ata ttt gat gct gtt gtc tca agg cac agt gaa gag aac atg gac aag 1584  
 Ile Phe Asp Ala Val Val Ser Arg His Ser Glu Glu Asn Met Asp Lys  
 515 520 525

acc att cia gtc aga aat gaa aac atc aaa tta aat gaa ctt gca cct 1632  
 Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro  
 530 535 540

gta aag cct cga cag agc cta acc ctc agt tca act ttc acc aat aaa 1680  
 Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys  
 545 550 555 560

gag gct ctc ctt gat gtt gat tcc agt cca gag gga tct ggg act gaa 1728  
 Glu Ala Leu Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu  
 565 570 575

gat aac tta caa tga 1743  
 Asp Asn Leu Gln  
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<210> 4

&lt;211&gt; 580

&lt;212&gt; PRT

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 4

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Leu Ile Phe Leu Val Gly Ile Trp Ala Ala Trp Lys Thr Lys Asn Ser  
20 25 30  
Gly Asn Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp  
35 40 45  
Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly  
50 55 60  
Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys  
65 70 75 80  
Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile  
85 90 95  
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val  
100 105 110  
Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly  
115 120 125  
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala  
130 135 140  
Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp  
145 150 155 160  
Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr  
165 170 175  
Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu  
180 185 190  
Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser  
195 200 205  
His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr  
210 215 220  
Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp  
225 230 235 240

Leu Asp Asn Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala  
 245 250 255  
 Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val  
 260 265 270  
 Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala  
 275 280 285  
 Ile Cys Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala  
 290 295 300  
 Tyr Gly Phe Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu  
 305 310 315 320  
 Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly  
 325 330 335  
 Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile  
 340 345 350  
 Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe  
 355 360 365  
 Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr  
 370 375 380  
 Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys  
 385 390 395 400  
 Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile  
 405 410 415  
 Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr  
 420 425 430  
 Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr  
 435 440 445  
 Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly  
 450 455 460  
 Tyr Tyr Pro Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys  
 465 470 475 480  
 Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr  
 485 490 495  
 Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp  
 500 505 510  
 Ile Phe Asp Ala Val Val Ser Arg His Ser Glu Glu Asn Met Asp Lys

515                      520                      525  
 Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro  
 530                      535                      540  
 Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys  
 545                      550                      555                      560  
 Glu Ala Leu Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu  
 565                      570                      575  
 Asp Asn Leu Gln  
 580

<210> 5  
 <211> 1743  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (1)..(1743)

<400> 5  
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 Met Ala Phe His Val Glu Gly Leu Ile Ala Ile Ile Val Phe Tyr Leu  
 1                      5                      10                      15  
 cta att ttg ctg gtt gga ata tgg gct gcc tgg aga acc aaa aac agt 96  
 Leu Ile Leu Leu Val Gly Ile Trp Ala Ala Trp Arg Thr Lys Asn Ser  
 20                      25                      30  
 ggc agc gca gaa gag cgc agc gaa gcc atc ata gtt ggt ggc cga gat 144  
 Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp  
 35                      40                      45  
 att ggt tta ttg gtt ggt gga ttt acc atg aca gct acc tgg gtc gga 192

WO 01/16315

Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly  
 50 55 60

gga ggg tat atc aat ggc aca gct gaa gca gtt tat gla cca ggt tat 240  
 Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Val Pro Gly Tyr  
 65 70 75 80

ggc cta gct tgg gct cag gca cca att gga tat tct ctt agt ctg att 288  
 Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile  
 85 90 95

tta ggt ggc ctg ttc ttt gca aaa cct atg cgt tca aag ggg tat gtg 336  
 Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val  
 100 105 110

acc atg tta gac ccg ttt cag caa atc tat gga aaa cgc atg ggc gga 384  
 Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly  
 115 120 125

ctc ctg ttt att cct gca ctg atg gga gaa atg ttc tgg gct gca gca 432  
 Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala  
 130 135 140

att ttc tct gct ttg gga gcc acc atc agc gtg atc atc gat gtg gat 480  
 Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp  
 145 150 155 160

atg cac att tct gtc atc atc tct gca ctc att gcc act ctg tac aca 528  
 Met His Ile Ser Val Ile Ile Ser Ala Leu Ile Ala Thr Leu Tyr Thr  
 165 170 175

ctg gtg gga ggg ctc tat tct gtg gcc tac act gat gtc gtt cag ctc 576  
 Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu  
 180 185 190



ttt tgc att ttt gta ggg ctg tgg atc agc gtc ccc ttt gca ttg tca 624  
 Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser  
 195 200 205

cat cct gca gtc gca gac atc ggg ttc act gct gtg cat gcc aaa tac 672  
 His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr  
 210 215 220

caa aag ccg tgg ctg gga act gtt gac tca tct gaa gtc tac tct tgg 720  
 Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser Glu Val Tyr Ser Trp  
 225 230 235 240

ctt gat agt ttt ctg ttg ttg atg ctg ggt gga atc cca tgg caa gca 768  
 Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala  
 245 250 255

tac ttt cag agg gtt ctg tct tct tcc tca gcc acc tat gct caa gtg 816  
 Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val  
 260 265 270

ctg tcc ttc ctg gca gct ttc ggg tgc ctg gtg atg gcc atc cca gcc 864  
 Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Ile Pro Ala  
 275 280 285

ata ctg att ggg gcc att gga gca tca aca gac tgg aac cag act gca 912  
 Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala  
 290 295 300

tat ggg ctt cca gat ccc aag act aca gaa gag gca gac atg att tta 960  
 Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu Ala Asp Met Ile Leu  
 305 310 315 320

cca att gtt ctg cag tat ctg tgc cct gtg tat att tct ttc ttt ggt 1008  
 Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly  
 325 330 335

ctt ggt gca gtt tct gct gct gtt atg tca tca gca gat tct tcc atc 1056  
 Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile  
 340 345 350

tig tca gca agt tcc atg ttt gca cgg aac atc tac cag ctt tcc ttc 1104  
 Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe  
 355 360 365

aga caa aat gct tcg gac aaa gaa atc gtt tgg gtt atg cga atc aca 1152  
 Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr  
 370 375 380

gtg ttt gtg ttt gga gca tct gca aca gcc atg gcc ttg ctg acg aaa 1200  
 Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys  
 385 390 395 400

act gtg tat ggg ctc tgg tac ctc agt tct gac ctt gtt tac atc gtt 1248  
 Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Val  
 405 410 415

atc ttc ccc cag ctg ctt tgt gta ctc ttt gtt aag gga acc aac acc 1296  
 Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val Lys Gly Thr Asn Thr  
 420 425 430

tat ggg gcc gtg gca ggt tat gtt tct ggc ctc ttc ctg aga ata act 1344  
 Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu Phe Leu Arg Ile Thr  
 435 440 445

gga ggg gag cca tat ctg tat ctt cag ccc ttg atc ttc tac cct ggc 1392  
 Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly  
 450 455 460

tat tac cct gat gat aat ggt ata tat aat cag aaa ttt cca ttt aaa 1440  
 Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln Lys Phe Pro Phe Lys

465                      470                      475                      480  
 aca ctt gcc atg gtt aca tca ttc tta acc aac att tgc atc tcc tat 1488  
 Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn Ile Cys Ile Ser Tyr  
                     485                      490                      495  
 cia gcc aag tat cia ttt gaa agt gga acc ttg cca cct aaa tta gat 1536  
 Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp  
                     500                      505                      510  
 gta ttt gat gct gtt gtt gca aga cac agt gaa gaa aac atg gat aag 1584  
 Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys  
                     515                      520                      525  
 aca att ctt gtc aaa aat gaa aat att aaa tta gat gaa ctt gca ctt 1632  
 Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu Asp Glu Leu Ala Leu  
                     530                      535                      540  
 gtg aag cca cga cag agc atg acc ctc agc tca act ttc acc aat aaa 1680  
 Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser Thr Phe Thr Asn Lys  
                     545                      550                      555                      560  
 gag gcc ttc ctt gat gtt gat tcc agt cca gaa ggg tct ggg act gaa 1728  
 Glu Ala Phe Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu  
                     565                      570                      575  
 gat aat tta cag tga 1743  
 Asp Asn Leu Gln  
                     580

&lt;210&gt; 6

&lt;211&gt; 580

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 6

Met Ala Phe His Val Glu Gly Leu Ile Ala Ile Ile Val Phe Tyr Leu  
 1 5 10 15  
 Leu Ile Leu Leu Val Gly Ile Trp Ala Ala Trp Arg Thr Lys Asn Ser  
 20 25 30  
 Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp  
 35 40 45  
 Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly  
 50 55 60  
 Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Val Pro Gly Tyr  
 65 70 75 80  
 Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile  
 85 90 95  
 Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val  
 100 105 110  
 Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly  
 115 120 125  
 Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala  
 130 135 140  
 Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp  
 145 150 155 160  
 Met His Ile Ser Val Ile Ile Ser Ala Leu Ile Ala Thr Leu Tyr Thr  
 165 170 175  
 Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu  
 180 185 190  
 Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser  
 195 200 205  
 His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr  
 210 215 220  
 Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser Glu Val Tyr Ser Trp  
 225 230 235 240  
 Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala  
 245 250 255  
 Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val

260 265 270  
 Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Ile Pro Ala  
 275 280 285  
 Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala  
 290 295 300  
 Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu Ala Asp Met Ile Leu  
 305 310 315 320  
 Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly  
 325 330 335  
 Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile  
 340 345 350  
 Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe  
 355 360 365  
 Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr  
 370 375 380  
 Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys  
 385 390 395 400  
 Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Val  
 405 410 415  
 Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val Lys Gly Thr Asn Thr  
 420 425 430  
 Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu Phe Leu Arg Ile Thr  
 435 440 445  
 Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly  
 450 455 460  
 Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln Lys Phe Pro Phe Lys  
 465 470 475 480  
 Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn Ile Cys Ile Ser Tyr  
 485 490 495  
 Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp  
 500 505 510  
 Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys  
 515 520 525  
 Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu Asp Glu Leu Ala Leu  
 530 535 540

Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser Thr Phe Thr Asn Lys  
545 550 555 560  
Glu Ala Phe Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu  
565 570 575  
Asp Asn Leu Gln  
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<210> 7  
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<221> CDS  
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<400> 7  
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Met Ser Phe His Val Glu Gly Leu Val Ala Ile Ile Leu Phe Tyr Leu  
1 5 10 15

ctt ata ttt ctg gtt gga ata tgg gct gca tgg aaa acc aaa aac agc 96  
 Leu Ile Phe Leu Val Gly Ile Trp Ala Ala Trp Lys Thr Lys Asn Ser  
 20 25 30

ggc aac cca gaa gag cac agt gaa gcc atc ata gtc ggg ggc cgt gac 144  
Gly Asn Pro Glu Glu His Ser Glu Ala Ile Ile Val Gly Gly Arg Asp  
35 40 45

att ggt ttg ttg gtt ggt ggt ttt acc atg aca gcc acc tgg gtt gga 192  
Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly  
50 55 60

gga ggc tac atc aat ggg aca gca gaa gca gtg tat ggg cca ggt tgt 240  
 Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys  
 65 70 75 80

ggt cta gct tgg gct cag gca ccc att gga tat tct ctg agt cta att 288  
 Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile  
 85 90 95

tta ggt ggt ctg ttt ttt gcg aaa cct atg cgt tcc aag gga tat gtg 336  
 Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val  
 100 105 110

act atg tta gac cca ttt caa cag atc tat gga aag cgc atg ggt ggg 384  
 Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly  
 115 120 125

ctg ctc ttc atc cct gca ctg atg gga gag atg ttc tgg gct gca gca 432  
 Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala  
 130 135 140

att ttc tct gca tta ggg gcc acc atc agc gtg atc att gat gtg gat 480  
 Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp  
 145 150 155 160

gtg aac ata tcg gtc att gtc tct gca ctc att gcc att ctt tat acc 528  
 Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr  
 165 170 175

cta gtg ggt ggg ctc tac tct gtg gca tat act gat gtt gtc cag cta 576  
 Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu  
 180 185 190

ttc tgc att ttt ata gga ctg tgg atc agt gtc cct ttt gcc ctg tca 624  
 Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser  
 195 200 205

cat cct gca gtc acc gac atc gga ttc aca gct gtg cat gct aaa tac 672  
His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr

210

215

220

cag agt ccc tgg ctg gga acc att gaa tca gtt gaa gtc tac acc tgg 720  
Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp

225

230

235

240

ctt gat aat ttt ctg tta ttg atg ctg ggt gga atc cca tgg caa gcc 768  
Leu Asp Asn Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala

245

250

255

tac ttc cag agg gtc ctc tct tca tcc tca gcc acc tat gct cag gta 816  
Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val

260

265

270

ctg tcc ttc ctg gca gct ttt ggg tgc ctg gtg atg gct cta ccc gcc 864  
Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala

275

280

285

ata tgc ata gga gct att gga gct tcc aca gac tgg aac cag act gcc 912  
Ile Cys Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala

290

295

300

tac ggg tat cca gat ccc aag act aag gag gaa gca gac atg att ctc 960  
Tyr Gly Tyr Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu

305

310

315

320

ccg atc gtt ctg cag tac ctc tgc cct gtg tac atc tcc ttc ttt ggg 1008  
Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly

325

330

335

ctt ggt gct gtt tca gct gct gtc atg tcc tca gct gac tgc tcc atc 1056  
Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile



340	345	350	
ctg tcg gcg agt tct atg ttt gct cgg aat atc tac cag ctt tcc ttc			1104
Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe			
355	360	365	
aga caa aat gca tca gac aag gaa att gtg tgg gtc atg agg atc act			1152
Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr			
370	375	380	
gtg ctt gtg ttc gga gca tct gca aca gcc atg gct ttg ctg acg aag			1200
Val Leu Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys			
385	390	395	400
act gtg tat ggg ctc tgg tac ctg agc tct gac ctt gtc tac atc atc			1248
Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile			
405	410	415	
atc ttc cca cag ctg ctc tgt gta ctc ttc atc aaa gga acc aac act			1296
Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr			
420	425	430	
tat ggg gca gtt gct ggt tat att ttt gga cta ttc ctg aga att act			1344
Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr			
435	440	445	
gga gga gag cca tat cta tac ttg cag ccc tta atc ttc tac cct ggt			1392
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly			
450	455	460	
tat tac tct gac aag aat ggt ata tac aat cag agg ttc cca ttt aaa			1440
Tyr Tyr Ser Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys			
465	470	475	480
act ctc tcc atg gtt acc tca ttc ttt acc aac att tgt gtt tct tat			1488

Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr  
 485 490 495

cta gcc aag tat cta ttt gaa agt gga acc ttg cct cca aaa tta gat 1536  
 Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp  
 500 505 510

gia ttt gat gct gtt gtc gca agg cac agt gaa gag aac atg gac aag 1584  
 Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys  
 515 520 525

acc att cta gtc aga aat gaa aat atc aaa tta aat gaa ctt gca cct 1632  
 Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro  
 530 535 540

gtg aaa cct cgg cag agc cta acc ctc agt tca act ttc acc aat aag 1680  
 Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys  
 545 550 555 560

gag gcc ctc ctt gat gtt gat tcc agt ccg gag ggg tct ggg act gaa 1728  
 Glu Ala Leu Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu  
 565 570 575

gat aac tta caa tga 1743  
 Asp Asn Leu Gln  
 580

<210> 8

<211> 580

<212> PRT

<213> Mus musculus

<400> 8

Met Ser Phe His Val Glu Gly Leu Val Ala Ile Ile Leu Phe Tyr Leu

1                      5                      10                      15  
 Leu Ile Phe Leu Val Gly Ile Trp Ala Ala Trp Lys Thr Lys Asn Ser  
                     20                      25                      30  
 Gly Asn Pro Glu Glu His Ser Glu Ala Ile Ile Val Gly Gly Arg Asp  
                     35                      40                      45  
 Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly  
                     50                      55                      60  
 Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys  
                     65                      70                      75                      80  
 Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile  
                     85                      90                      95  
 Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val  
                     100                      105                      110  
 Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly  
                     115                      120                      125  
 Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala  
                     130                      135                      140  
 Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp  
                     145                      150                      155                      160  
 Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr  
                     165                      170                      175  
 Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu  
                     180                      185                      190  
 Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser  
                     195                      200                      205  
 His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr  
                     210                      215                      220  
 Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp  
                     225                      230                      235                      240  
 Leu Asp Asn Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala  
                     245                      250                      255  
 Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val  
                     260                      265                      270  
 Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala  
                     275                      280                      285

Ile Cys Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala  
 290 295 300  
 Tyr Gly Tyr Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu  
 305 310 315 320  
 Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly  
 325 330 335  
 Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile  
 340 345 350  
 Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe  
 355 360 365  
 Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr  
 370 375 380  
 Val Leu Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys  
 385 390 395 400  
 Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile  
 405 410 415  
 Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr  
 420 425 430  
 Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr  
 435 440 445  
 Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly  
 450 455 460  
 Tyr Tyr Ser Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys  
 465 470 475 480  
 Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr  
 485 490 495  
 Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp  
 500 505 510  
 Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys  
 515 520 525  
 Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro  
 530 535 540  
 Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys  
 545 550 555 560  
 Glu Ala Leu Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu

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PCT/JP00/05545

565

570

575

Asp Asn Leu Gln

580